REMARKS

Claims 1 through 39 are currently pending in the application.

Claims 7 through 11, 20 through 24 and 33 through 37 are withdrawn from consideration as being directed to a non-elected invention.

Claims 1 through 6, 12 through 19, 25 through 32, 38 and 39 are rejected.

This amendment is in response to the Office Action of December 30, 2003.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on Yoshigai (U.S. Patent 5,606,199)

Claims 1, 12 through 14, 25 through 27, 38 and 39 are rejected under 35 U.S.C. § 102(b) as being anticipated by Yoshigai (U.S. Patent 5,606,199) (hereinafter Yoshigai). Applicant respectfully traverses this rejection.

Applicant asserts that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicant has amended the claimed invention to clearly distinguish over the cited prior art.

Applicant asserts that the Yoshigai reference does not and cannot anticipate the presently claimed inventions of presently amended independent claims 1 14 and 27 because the Yoshigai reference does not identically describe, either expressly or inherently, each and every element of the presently claimed inventions in as complete detail as is contained in the presently amended independent claims 1, 14, and 27.

Turing to the Yoshigai reference, described therein is a tape carrier having an island 7 suspended by four suspending pins 8, with a central recess 7a as a chip support section in which the semiconductor chip 4 is mounted. Ground leads 3G of the tape carrier connect electrode pads 4a of the chip 4 and inner lead sections 6a of corresponding lead frame leads 6. Each of the

ground leads 3G has two branch leads 3d which are connected to different portions of an island 7 of the tape carrier.

Applicant asserts that the Yoshigai reference clearly does not identically describe each an every element of the embodiments of the presently claimed inventions set forth in presently amended independent claims 1, 14, and 27. For instance, Applicant asserts that the Yoshigai reference fails to identically describe, either expressly or inherently, each and every element of presently the embodiments of the presently claimed inventions of presently amended independent claims 1, 14, and 27 calling for "a paddle frame having no electrical leads for connection to a semiconductor die, the paddle frame including a pair of side rails, a plurality of cross-members, and a generally centrally positioned paddle of a plurality of paddle frames having the pair of side rails and the plurality of cross members connected to said paddle by a plurality of paddle support bars, said second surface of said semiconductor die being secured to said paddle, the paddle being attached to the side rail by at least two of the plurality of paddle support bars and being attached to the cross members by at least two of the plurality of support bars", "a metal paddle from a paddle frame having no electrical leads for connection to the semiconductor die of a plurality of paddle frames connected by a pair of rails having a plurality of cross members therebetween, said second surface of said semiconductor die being attached to said paddle, said metal paddle attached to at least one side rail by at least a plurality of paddle support bars and being attached to a plurality of cross members by said support bars", and "a metallic paddle having no electrical leads for connection to a semiconductor die secured to said second surface of said semiconductor die, said metallic paddle being attached to at least one side rail by at least a plurality of paddle support bars and being attached to a plurality of cross members by said support bars of a paddle frame".

Applicant asserts that the Yoshigai reference contains no description whatsoever of a paddle frame having no electrical leads for connection to a semiconductor die. The Yoshigai reference describes a tape carrier having a plurality of leads and an island thereon.

Since the Yoshigai reference does not identically describe each and every element of the embodiments of the presently claimed inventions of presently amended independent claims 1, 14, and 27, the Yoshigai reference cannot and does not anticipate such presently claimed inventions

under 35 U.S.C. § 102. Therefore, presently amended independent claims 1, 14, and 27 are allowable as well as dependent claims2 through 6, 12, 13, 15 through 19, 25, 26, 28 through 32, 38, and 39 therefrom.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on Yoshigai (U.S. Patent 5,606,199) as applied to claims 1, 12 through 14, 25 through 27, 38 and 39, and further in combination with Applicant's Admitted Prior Art

Claims 2 through 6, 15 through 19 and 28 through 32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshigai as applied to claims 1, 12 through 14, 25 through 27, 38 and 39, and further in combination with Applicant's admitted prior art.

Applicant further submits that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicant has amended the claimed invention to clearly distinguish over the cited prior art.

Again, the Yoshigai reference teaches or suggests therein is a tape carrier having an island 7 suspended by four suspending pins 8, with a central recess 7a as a chip support section in which the semiconductor chip 4 is mounted. Ground leads 3G of the tape carrier connect electrode pads 4a of the chip 4 and inner lead sections 6a of corresponding lead frame leads 6. Each of the ground leads 3G has two branch leads 3d which are connected to different portions of an island 7 of the tape carrier.

Applicants admitted prior art, as set forth on pages 2 and 3 of the specification states that:

Thus, for low-power devices of less than about 1 watt, the metal lead frame itself may be sufficient to dissipate generated heat. Lead frame configurations for improved heat dissipation are shown in United States Patent 5,541,446 of Kierse, United States Patent 4,961,107 of Geist et al., and United States Patent 5,101,465 of Murphy.

For higher power packaged devices, a metal heat spreader may be incorporated into the package or attached to the outside of the package. Because of the generally low thermal conductivity of polymers, the heat dissipation design is more critical for polymer-packaged devices than for those packaged in ceramic or metal.

The use of heat spreaders/heat sinks/heat dissipaters in packaged semiconductor devices are often used to conduct heat to the exterior of the devices, either directly or via the leads. A wide variety of such is illustrated in United States Patent 5,596,231 of Combs, United States Patent 5,594,282 of Otsuki, United States Patent 5,598,034 of Wakefield, United States Patent 5,489,801 to Blish II, United States Patent 4,024,570 of Hartmann et al., United States Patents 5,378,924 and 5,387,554 of Liang, United States Patent 5,379,187 of Lee et al., United States Patent 4,507,675 of Fujii et al., United States Patent 4,642,671 of Rohsler et al., United States Patent 4,931,852 of Brown et al., United States Patent 5,173,764 of Higgins III, United States Patent 5,379,186 to Gold et al., United States Patent 5,434,105 to Liou, and United States Patent 5,488,254 to Nishimura et al.

The above-indicated references may be characterized as providing complex devices requiring difficult and/or costly processes to achieve the desired heat dissipation. Most of the references are not applicable at all to a high density device attached in a bare state to a substrate such as a circuit board.

Encapsulation compositions and methods are shown in United States Patent 4,358,552 to Shinohara et al. and United States Patent 5,194,930 to Papathomas et al.

Applicant asserts that such admitted prior art is directed to conventional lead frames having electrical leads connected to semiconductor die, semiconductor die connected to die paddles of conventional lead frames, and semiconductor die having heat sinks connected thereto.

Applicant asserts that there is no description whatsoever in such admitted prior art regarding a paddle frame as set forth in the embodiments of the presently claimed inventions of presently amended independent claims 1, 14, and 27.

Applicant assert that any combination of the Yoshigai reference and the admitted prior art does not and cannot establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding such presently claimed inventions because, at the very least, there is no teaching or suggestion of all of the claim limitations of the presently claimed inventions and the suggestion to make the claimed combination and the reasonable expectation of success is not found in any combination of the cited prior art but, rather can only be based solely on Applicant's disclosure.

Applicant asserts that any combination of the Yoshigai reference and the admitted prior art does not teach or suggest the claim limitations of the embodiments of the presently claimed inventions of presently amended independent claims 1, 14, and 27 calling for "a paddle frame having no electrical leads for connection to a semiconductor die, the paddle frame including a pair of side rails, a plurality of cross-members, and a generally centrally positioned paddle of a plurality of paddle frames having the pair of side rails and the plurality of cross members connected to said paddle by a plurality of paddle support bars, said second surface of said semiconductor die being secured to said paddle, the paddle being attached to the side rail by at least two of the plurality of paddle support bars and being attached to the cross members by at least two of the plurality of support bars", "a metal paddle from a paddle frame having no electrical leads for connection to the semiconductor die of a plurality of paddle frames connected by a pair of rails having a plurality of cross members therebetween, said second surface of said semiconductor die being attached to said paddle, said metal paddle attached to at least one side rail by at least a plurality of paddle support bars and being attached to a plurality of cross members by said support bars", and "a metallic paddle having no electrical leads for connection to a semiconductor die secured to said second surface of said semiconductor die, said metallic paddle being attached to at least one side rail by at least a plurality of paddle support bars and being attached to a plurality of cross members by said support bars of a paddle frame".

Applicant asserts that any combination of the Yoshigai reference and the admitted prior art contains no teaching or suggestion whatsoever of a paddle frame having no electrical leads for

connection to a semiconductor die. The Yoshigai reference describes a tape carrier having a plurality of leads and an island thereon. The admitted prior art is directed to conventional lead frames having electrical leads, a die paddle, and a heat sink.

Applicant asserts that, at best, any combination of the Yoshigai reference and the admitted prior art would only teach or suggest the inclusion of a heat sink in the Yoshigai tape carrier.

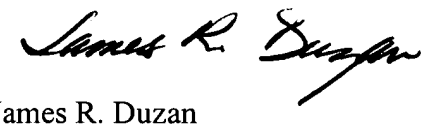
Further, since any combination of the Yoshigai reference and the admitted prior art fails to provide the suggestion to make the claimed combination and any reasonable expectation of success is not found in any combination of the cited prior art, Applicant assert that any rejection of the embodiments of the presently claimed inventions of presently amended independent claims 1, 14, and 27 based upon any combination of the Yoshigai reference and the admitted prior art is based solely on Applicant's disclosure. Such a rejection is neither contemplated by nor within the purview of 35 U.S.C. § 103 and, clearly, improper.

Since any combination of the Yoshigai reference and the admitted prior art does not teach or suggest all the claim limitations of the embodiments of the presently claimed inventions of presently amended independent claims 1, 14, and 27, any combination of the Yoshigai reference and the admitted prior art cannot and does not does not and cannot establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding such presently claimed inventions. Therefore, presently amended independent claims 1, 14, and 27 are allowable as well as dependent claims 2 through 6, 12, 13, 15 through 19, 25, 26, 28 through 32, 38, and 39 therefrom.

In summary, Applicant submits that claims 1 through 39 are clearly allowable over the cited prior art.

Applicant requests the allowance of claims 1 through 6, 12 through 19, 25 through 32, 39, and 39 and the case passed for issue.

Respectfully submitted,



James R. Duzan
Registration No. 28,393
Attorney for Applicant(s)
TRASKBRITT
P.O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: 801-532-1922

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